## CLAIMS:

1. A processing pad assembly, comprising:

an upper layer having a processing surface;

an electrode having a top side coupled to the upper layer and a bottom side opposite the top side;

a first set of holes formed through the upper layer for exposing the electrode to the processing surface; and

at least one aperture formed through the upper layer and the electrode.

2. The processing pad assembly of claim 1, wherein the electrode is fabricated from a corrosion resistant conductive metal.

3. The processing pad assembly of claim 2, wherein the corrosion resistant conductive metal is Sn, Ni, Ti, or Au.

4. The processing pad assembly of claim 1, wherein the electrode is fabricated from a conductive metal coated with a corrosion resistant conductive metal.

5. The processing pad assembly of claim 4, wherein the corrosion resistant conductive metal is Sn, Ni, Ti, or Au.

6. The processing pad assembly of claim 1, wherein the electrode is fabricated from a corrosion-resistant conductive alloy.

7. The processing pad assembly of claim 6, wherein the corrosion-resistant conductive alloy is bronze, brass, stainless steel, or a palladium-tin alloy.

8. The processing pad assembly of claim 1, wherein the electrode is fabricated from a metal-coated fabric.

9. The processing pad assembly of claim 1, wherein the electrode is fabricated from a polymer matrix with a conductive filler.

10. The processing pad assembly of claim 2, wherein the electrode is a solid sheet.

11. The processing pad assembly of claim 2, wherein the electrode is a metal screen.

12. The processing pad assembly of claim 2, wherein the electrode is a perforated sheet.

13. The processing pad assembly of claim 2, wherein the electrode is primed with an adhesion promoter on a side facing the upper layer.

14. The processing pad assembly of claim 13, wherein the adhesion promoter is conductive.

15. The processing pad assembly of claim 1, wherein the electrode is permeable.

16. The processing pad assembly of claim 15, wherein a polymer layer is applied to the bottom side of the electrode.

17. The processing pad assembly of claim 16, wherein the polymer layer penetrates through the electrode and is at least partially exposed on the top side of the electrode.

18. The processing pad assembly of claim 16, wherein the polymer layer has a strong interaction with an adhesive used to couple the top side of the electrode to the upper layer.

19. The processing pad assembly of claim 1, wherein the electrode is coupled to the upper layer by an adhesive.

20. The processing pad assembly of claim 19, wherein the adhesive is chemically resistant to the electrolyte.

21. The processing pad assembly of claim 1, wherein the upper layer is conductive.

22. The processing pad assembly of claim 1, wherein the upper layer is non-conductive.

23. The processing pad assembly of claim 22, wherein the upper layer is fabricated from polyurethane.

24. The processing pad assembly of claim 1, wherein the electrode further comprises a plurality of independently biasable electrical zones.

25. The processing pad assembly of claim 24, wherein the electrical zones further comprises concentric rings.

26. The processing pad assembly of claim 1, further comprising a subpad disposed between the electrode and the upper layer.

27. The processing pad assembly of claim 1, wherein the electrode further comprises:

a first conductive zone; and

at least a second conductive zone

28. The processing pad assembly of claim 27, wherein the electrode further comprises:

a first conductive element comprising the first conductive zone;

a second conductive element circumscribing the first conductive element comprising a second conductive zone; and

a third conductive element circumscribing the second conductive element comprising a third conductive zone.

29. A processing pad assembly, comprising:

an upper layer having a processing surface;

a corrosion resistant conductive metallic lower layer having a top side coupled to the upper layer and a bottom side opposite the top side, the lower layer having a plurality of laterally separated, independently electrically biasable zones;

a first set of holes formed through the upper layer for exposing the electrode to the processing surface; and

at least one aperture formed through the upper layer and the lower layer.

30. An apparatus for processing a substrate, comprising;

a platen assembly having a top surface;

a corrosion resistant conductive metallic lower layer having a top side coupled to the upper layer and a bottom side opposite the top side, the lower layer having a plurality of laterally separated, independently electrically biasable zones;

a dielectric processing surface coupled to the lower layer opposite the platen assembly and having at least two zones of different current permeability defined across the processing surface, wherein the at least two zones are defined by an attribute of the processing surface, comprising:

at least one conductive element positioned to contact a side of a substrate disposed on the processing surface;

a power source adapted to apply a bias between the conductive element and the zones of the lower layer; and

a carrier head disposed above the processing pad assembly and adapted to hold a substrate against the processing pad assembly and provide at least a portion of relative motion therebetween.